

<p>Technique</p>	<p>GN₂ is provided to the actuator breather of pneumatically actuated valves used in hostile environments (salt spray, high humidity, SRB exhaust).</p>
<div style="display: flex; align-items: center;">  <div style="text-align: center;"> <p>Use of GN₂ for Valve Corrosion Control</p> <p><i>Use of Gaseous Nitrogen (GN₂) provides a contamination and corrosion resistant atmosphere in pneumatically actuated valves.</i></p> </div> </div>	
<p>Benefit</p>	<p>Attaching a source of GN₂ to the actuator breather provides an atmosphere in the actuator chamber of pneumatically actuated valves that prevents corrosion thus lengthening the life of the valves.</p>
<p>Key Words</p>	<p>GN₂, Valves, Pneumatics</p>
<p>Application Experience</p>	<ul style="list-style-type: none"> • Space Shuttle Program • Kennedy Space Center (KSC) Launch Operations Area Hypergolic Servicing System
<p>Technical Rationale</p>	<p>When a pneumatically actuated valve is deactivated and the valve changes position, the valve diaphragm returns to the normal position and provides a vacuum at the actuator breather. This results in the outside air being drawn into the actuator chamber, along with any contaminants in the air. At the Space Shuttle launch pads the contaminants that are in the air include salt spray, SRB exhaust, possible N₂O₄ vapors, and water from high humidity. The contaminants cause corrosion in the actuator chamber affecting the operation of the valve. Providing GN₂ to the actuator breather eliminates the possibility of drawing contaminants into the chamber.</p>
<p>Contact Center</p>	<p>Kennedy Space Center (KSC)</p>

Use of GN₂ for Valve Corrosion Control
Technique OPS-16

GN₂ is provided to the actuator breather of the pneumatically actuated valves.

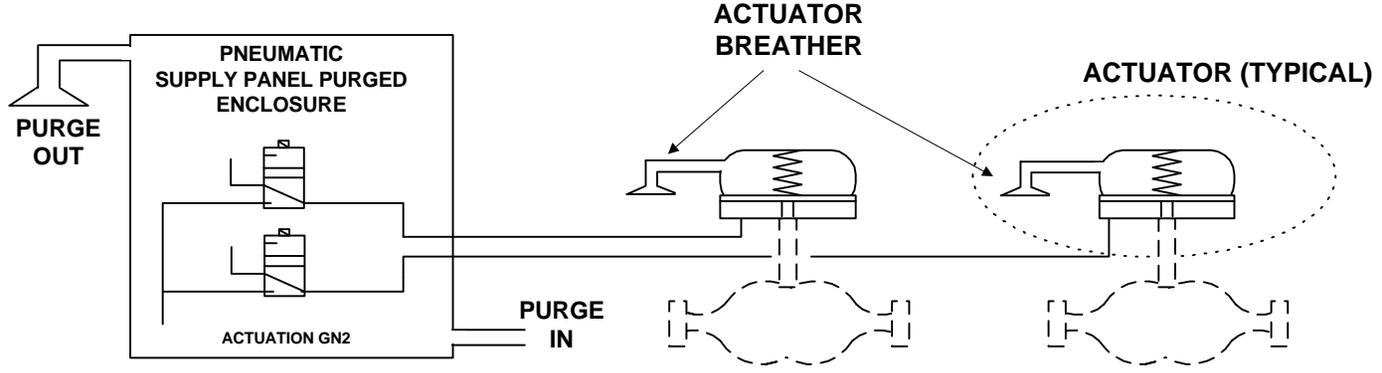
The source may be a dedicated GN₂ source or a more efficient means would be to tap off a nearby panel that uses GN₂ for an environmental or hazard proofing purge. A line connected from the panel to the actuator breather port would allow access to the GN₂ for filling the valve actuator chamber when the valve is deactivated (see Figure 1).

When designing the system, caution should be used to prevent or minimize back pressure on the actuator which would reduce actuator performance.

References

None.

BEFORE



AFTER

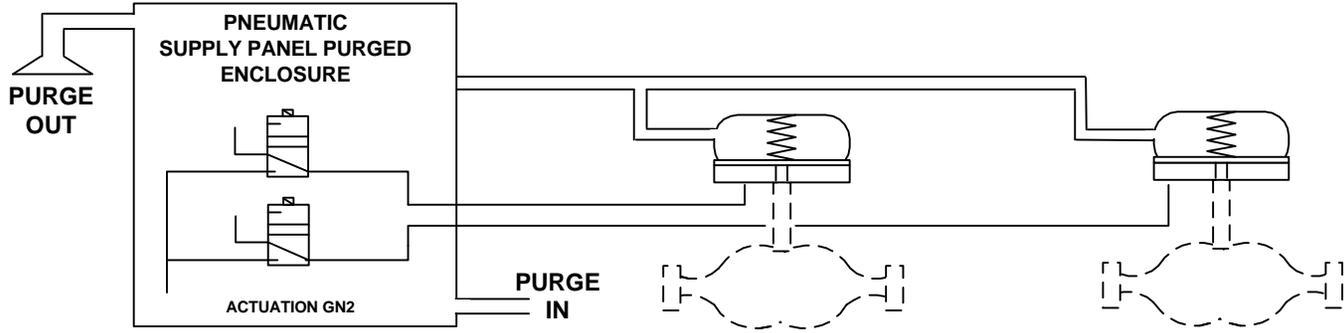


FIGURE 1. VALVE ACTUATOR BREATHER MODIFICATION